Journal of Coastal Conservation 10: 1-92, 2004

SPECIAL FEATURE

Coastal management: Issues and tools

Guest Editors
Francisco Taveira Pinto & Eddy van der Maarel

The nine papers presented in this Special Feature were originally presented at the Sixth International Conference LITTORAL 2000, held in Porto, Portugal

Contents

Journal of Coastal Conservation 10: 3-4, 2004

Coastal management: Issues and tools. Introduction

Taveira Pinto, Francisco

Faculty of Engineering, University of Porto, Rua do Dr. Roberto Frias, s/n, 4200-465 Porto, Portugal; Fax +351225081952; E-mail fpinto@fe.up.pt

Background

This Special Feature of the *Journal of Coastal Conservation* is devoted to Coastal Management. It will deal with various issues and existing tools for this specific analysis. The nine contributions contain interesting descriptions on the following issues and problems, with a logical pattern: estuaries, dunes, eutrophication and erosion, and some important tools: earth observation for coastal conservation analysis and coastal evolution, the European Habitats Directive, and social analysis.

Survey of contributions

Townend presents an interesting overview of the general methodology to enable a strategic management and planning within estuaries, while identifying a framework that enshrines sustainability. Any management initiative must address the issues of long-term change; physical, chemical and biological interactions; and system response (including socio-economic interactions). Achieving such a programme will need to take advantage of studies and research at a number of different spatial and temporal scales. These range from global climate change initiatives, through catchment and estuary-wide investigations to studies of specific features. For strategic planning and management, the goal is to be able to predict changes with a reasonable degree of confidence over a 20- to 50-year time horizon. Given the highly non-linear and complex adaptive nature of estuary systems, absolute predictions may not be possible. Rather, it will be realistic to identify probable/possible outcomes, or system states, as a basis for guiding management actions. This, in itself, will require managers and planners to move away from a prescriptive interventionist approach towards a more adaptive one.

In the perspective of *Townend*'s paper, the need to better manage estuaries includes the capability to make their environmental characterization following a methodology that allows the inter-comparison of distinct estuarine systems or the assessment of their evolution. *Cardoso & Carmona* present a proposal of a methodology that, starting with observed values, and using a procedure to integrate them in time and space in order to calculate significant values, develops normalized indicators which take into account criteria of evaluation based on legal, scientific or heuristic concentration limits. This methodology may be complemented with the definition of quality classes, particularly appealing and useful, as tools to communicate with decision makers and the public in general. Water quality data pertaining to the Tejo estuary are used to test the methodology.

Another important environmental issue in estuaries or closed seas is the eutrophication of coastal ecosystems, related with the increasing anthropogenic pressure. *Schiewer & Schernewski*, looking at the economic importance of the Baltic region, describe the so-called Agenda 21 for the Baltic region (Baltic 21), which has been developed to ensure sustainable development. Eutrophication remains the main ecological problem in the Baltic Sea because of its serious negative social and economic consequences. Inner and outer coastal waters play an important role as buffers and filters for the Baltic proper. Consequently, the utilization and preservation of the self-purification capacity is of great importance. Combined results of coastal research and of international forums are presented as well as conclusions for an improved ICZM of Baltic coastal ecosystem.

Looking at the need for paying special attention to conservation and management in other priority habitat types, *Provoost et al*. focus on the analysis of grey dunes, as they also appear in the landward zone of Belgian coastal dunes. Ecology knowledge of this particular habitat type will contribute to the realization of the EU Habitat Directive. With that purpose in mind, dune grassland succession and nutrient dynamics are analysed, in a way to understand the causes of the substantial loss of regional biodiversity. The Belgian experience is also useful since its characteristic vegetation, flora and fauna is limited. Evaluation of management measures focuses on biodiversity measurements

on the levels of landscape, communities and species.

Erosion is another important coastal management issue in any part of the world. *Veloso-Gomes et al.* present the case of the NW coast of Portugal, where severe erosion is taking place which threatens several areas. The main causes of this erosion are presented as well as a brief analysis of the forces driving erosion and the subsequent state of vulnerability that the Douro River - Cape Mondego stretch is currently facing. Main challenges and future trends in this study area are identified in the light of understanding what the underlying causes of the conflicts are and what realistically can be achieved, given the morphodynamics and hydrodynamic processes, as well as the human development in the area and the existing policies.

Looking at the benefits of using several tools for coastal management issues, it is necessary to discuss data from earth observation. To that aim *Thackrah et al.* present some approaches to the mapping and monitoring of the habitats in a National Nature Reserve of coastal sand dune systems in south Wales, UK, using useful earth observation methods. Conservation managers are facing the problem of the choice of sources of data to be used when producing a land cover map of the site of interest, in order to obtain the best possible results. For the specific area land cover mapping methods for conservation were investigated. As the land cover types of interest typically cover small areas within much larger sites the classification produced provides a set of competing hypotheses for the site. Preliminary results of the methods to resolve this competition are presented and discussed.

Earth observation is also related to the analysis of shoreline change, which is often based exclusively upon the littoral cell concept and modelling of hydrodynamic processes, especially on a long-term basis. *Burgess et al.* present that approach in the framework of the 'Futurecoast' study for the entire shoreline of England and Wales. This has been based upon an improved understanding of coastal systems and their behavioural characteristics, including a range of supporting studies, and focusing upon maximizing the use of existing information and experience. Additional data sets have also been produced. Descriptions of some key outputs from this research are presented.

Ports are important coastal structures which influence should not be neglected in any coastal management. With this idea in mind *Maes & Neumann* outline the implications of the Habitats Directive for port extension projects in or in the proximity of designated sites and for protection, from a nature conservation perspective, both of ecosystems and species. Preliminary conclusions are formulated and recommendations for similar projects are presented, based on case studies of large ports in Northwest Europe.

The perception of users is an important approach and tool for the goal of an integrated coastal management, namely in relation to the conflicts between coastal resources and the associated sociocultural and political issues. Conflicts may occur between stakeholders over goals, conservation and development trade-offs, access, and resource use rights. Decisions are currently made within a multi-stakeholder framework where there are few mechanisms for negotiation, transparency of decisions or feedback on consultation. *Rockloff & Lockie* focus on the conflicts that tend to arise between stakeholders within this framework and on the contribution of stakeholder analysis and social mapping to conflict management and reduction. As applied here, stakeholder analysis and social mapping are participatory tools used to document and feed back the values, interests, attitudes and aspirations of stakeholders.